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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/827,046	04/05/2001	Joseph V. Bak	2941	3455

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MACMILLAN, SOBANSKI & TODD, LLC  
ONE MARITIME PLAZA-FOURTH FLOOR  
720 WATER STREET  
TOLEDO, OH 43604

EXAMINER

JOHNSON, JONATHAN J

ART UNIT	PAPER NUMBER
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1725

DATE MAILED: 09/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/827,046	<b>Applicant(s)</b> BAK ET AL.	
	<b>Examiner</b> Jonathan Johnson	<b>Art Unit</b> 1725	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 14 July 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-17 and 31-33 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 and 31-33 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-16 and 31-33 are rejected under 35 U.S.C. 102(e) as being anticipated by Stewart (WO 01/70450). With respect to claims 1, 31, and 32, Stewart teaches a method of making a tool for molding a part such that the tool has a channel formed therein to provide the flow of fluid for heating/cooling the molded part (Figure 5b, item 24), the method comprising providing a plurality of tool sections in an unhardened state, each of a number of the tool sections having at least one of a groove in a surface thereof and a hole therethrough (page 28, first paragraph and figure 5, item 24), assembling the tool sections with surfaces thereof in facing relationship to form a tool block wherein the grooves and holes form at least one channel in the tool block (figure 5a-5c, item 24), wherein the channel is formed with at least one inlet and outlet at walls of the tool sections to provide the flow of fluid through the channel (page 15, second full paragraph), forming the tool sections so that they assume the shape of a tool when assembled (Figure 3, item 32), and diffusion bonding the facing surfaces by pressing the tool sections together at an elevated

temperature to form a block and machining said tool block to form a final tool shape (Page 34, third full paragraph and page 37, second full paragraph); and wherein said channel is formed along said surfaces to provide the flow of fluid through the channel along said surface (page 15, second full paragraph; particularly where the opening of the hole is at the surface of each plate section).

With respect to Claim 2, the teachings of Stewart are the same as relied upon in the rejection of Claim 1. Stewart teaches wherein said facing surfaces of said tool sections have complementary grooves therein and said tool sections are assembled with said complementary grooves in facing relationship to form said channel (Figure 3, item 24 and figure 4, holes).

With respect to Claim 3, the teachings of Stewart are the same as relied upon in the rejection of Claim 2. Stewart teaches each said groove has a predetermined cross-sectional configuration that provides said channel with a predetermined cross-sectional configuration after said diffusion bonding step (page 15, second full paragraph).

With respect to Claim 4, the teachings of Stewart are the same as relied upon in the rejection of Claim 2. Stewart teaches the tool includes at least three said tool sections, at least one of which has grooves in two opposing surfaces thereof (Figure 5b, item 24 at each surface).

With respect to Claim 5, the teachings of Stewart are the same as relied upon in the rejection of Claim 4. Stewart teaches said facing surfaces of said tool sections are planar and opposing surfaces of each said tool section are substantially parallel (figure 4, item 22 and Figure 3, item 32).

With respect to Claim 6, the teachings of Stewart are the same as relied upon in the rejection of Claim 2. Stewart teaches the tool includes at least one said groove in one said tool section in fluid communication with at least one said hole through an adjacent said tool section (page 15, second full paragraph).

With respect to Claim 7, the teachings of Stewart are the same as relied upon in the rejection of Claim 1. Stewart teaches the step of grinding and polishing said facing surfaces of said adjacent tool sections to a predetermined surface finish prior to said diffusion bonding step (pages 17 and 18).

With respect to Claim 8, the teachings of Stewart are the same as relied upon in the rejection of Claim 7. Stewart teaches the predetermined surface finish is controlled to provide a bond between said tool sections that includes imperfections (page 19, first full paragraph).

With respect to Claim 9, the teachings of Stewart are the same as relied upon in the rejection of Claim 8. Stewart teaches at least one of the composition of the ambient atmosphere, said pressure and temperature are controlled to provide a bond between said

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tool sections that includes imperfections for permitting nondestructive separation of said bonded tool sections (page 35, first full paragraph and page 36, first paragraph).

With respect to Claim 10, the teachings of Stewart are the same as relied upon in the rejection of Claim 1. Stewart teaches cooling said diffusion bonded tool sections under conditions that leave said material in an annealed state that permits machining thereof (page 37, first full paragraph).

With respect to Claim 11, the teachings of Stewart are the same as relied upon in the rejection of Claim 1. Stewart teaches forming said tool sections so that they assume the shape of a tool when assembled; and cooling or heating said diffusion bonded tool sections under conditions that leave said material in a hardened state (Figure 4, item 22 and page 34, first full paragraph).

With respect to claims 12 and 33, Stewart teaches cutting a body of tool material in an annealed state into layers with opposing surfaces (pages 17-19 and page 2); forming in each of a number of said layers at least one of a groove in a surface thereof and a hole therethrough (Figure 5b, item 24); assembling said layers in facing relationship so that said grooves and holes form at least one channel in said assembled layers (Figure 4, item 22) where the channel is formed with at least one inlet and outlet at outer walls of the tool sections to provide the flow of fluid through the channel (figure 4, item 24); and diffusion bonding the facing surfaces by pressing the tool sections together at an elevated temperature to form a block and machining said tool block to form a final tool shape (Page 34, third full paragraph and page 37, second full paragraph). Stewart

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also teaches the water cutting process does not impart any residual stresses during cutting (page 19); and wherein said channel is formed along said surfaces to provide the flow of fluid through the channel along said surface (page 15, second full paragraph; particularly where the opening of the hole is at the surface of each plate section).

With respect to Claim 13, the teachings of Stewart are the same as relied upon in the rejection of Claim 12. Stewart teaches cooling said diffusion bonded layers under conditions that leave said material in an annealed state that permits machining thereof; machining said diffusion bonded layers to form a tool with a predetermined configuration relative to said channel; and heat treating said machined tool to cause it to assume a hardened state (page 37).

With respect to Claim 14, the teachings of Stewart are the same as relied upon in the rejection of Claim 12. Stewart teaches forming said layers so that they assume the shape of a tool when assembled (figure 5); and cooling said layers under conditions that leave said material in a hardened state (page 37).

With respect to Claim 15, the teachings of Stewart are the same as relied upon in the rejection of Claims 13 and 14. Stewart teaches the material is selected from the group comprising: Composition AISI Designation (weight %) HRC S7 chrome-moly shock C 0.5; Si 0.25; V 3.25; Mn 45-57 resistant steel 0.7; Mo 1.4 A2 air hardening C 1.0; V 0.25; Si 0.60; Mo 57-62 tool steel 1.1; Cr 5.25; Mn 0.6 M2 moly-tungsten C 0.83; Mo 5.0; W 6.35; Cr 60-65 high speed steel 4.15; V 1.9 W2 water hardening C 0.070 to 1.3

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50-64 carbon tool steel 420 stainless steel C 0.3-0.4; Mn 1.0 max; P 48-52 0.03 max; S 0.03 max; Si 1.0 max; Cr 12.0-14.0 H-13 hot work steel C 0.4; Si 1.0; V 1.05; Cr 38-53 5.25; Mo 1.25; Mn 0.4 D2 high carbon/high C 1.55; Cr 12; Mo 0.08; V 54-61 chrome tool steel 0.09 D3 high carbon/high C 2.2; Cr 12; V 1.0 54-61 chrome tool steel and a beryllium/copper alloy that is heat treatable and has an HRC value of 38-42, and titanium and titanium alloys, and metals from which oxides are removed from said facing surfaces and said surfaces are degreased and cleaned, and wherein HRC is the Rockwell-C hardness of the material in a hardened state (page 2 and page 36, first full paragraph).

With respect to Claim 16, the teachings of Stewart are the same as relied upon in the rejection of Claims 12. Stewart teaches the facing surfaces include indexing means for fixedly locating said surfaces relative to each other and said grooves are located precisely relative to said indexing means (Figure 4, edges of item 22).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stewart (WO 01/70450) as applied to Claim 16 above and further in view of Weaver (5,031,483). Weaver teaches the indexing means comprises indexing holes formed in said block



before cutting it into said layers; said layers are cut so that each layer includes at least two indexing holes in said opposing surfaces; and said layers are assembled by aligning said indexing holes and placing an indexing member therein (Figure 1, item 24). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the indexing system of Stewart to utilize indexing holes and placement of an indexing member therein in order to provide proper registration of the surfaces (see Weaver col. 5, ll. 1-25).

### ***Response to Arguments***

Applicant argues Stewart does not teach diffusion bonding tool sections to one another to form a tool block, then machining the diffusion bonded tool block to form a final tool shape as required by claims 1 and 12. The examiner disagrees. Stewart teaches diffusion bonding the tool sections by pressing the tool sections together at an elevated temperature (page 34, third full paragraph). Afterwards, Stewart teaches machining the tool block to form a final tool shape through his use of abrasive flow machining the tool block to smooth and deflash the cooling channels, thus giving the tool block its final tool shape (page 37, third and fourth full paragraph).

Applicant argues Stewart does not teach the tool sections having a “groove along the surface” thereof such that a channel is formed with at least one inlet and outlet, as required by claims 1, 12, and 31-33. The examiner disagrees. During patent examination, the pending claims must be “given the broadest reasonable interpretation.” Applicant always has the opportunity to amend the claims during prosecution, and broad interpretation by the examiner reduces the possibility that the claim, once issued, will be

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interpreted more broadly than is justified. In re Prater, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-51 (CCPA 1969). The examiner notes that the term "groove" is not clearly defined in applicant's specification. In the instant case, the examiner broadly interprets a "groove" to be a depression, as defined by Webster's dictionary. It is the examiner's position that the hole cut in the tool section necessarily has a "groove" or depression in it when viewed along the surface of the tool part. Furthermore, it is the examiner's position that, when viewed along the surface of the tool part, the stacking of the tool parts results the transformation of the "grooves" or depressions into channels.

### ***Conclusion***


Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Johnson whose telephone number is 571-272-1177. The examiner can normally be reached on M-Th 7AM-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on 571-272-1171. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Jonathan Johnson  
Examiner  
Art Unit 1725